

Release notes for ENDF/B Development n-056_Ba_138
evaluation

ENDF
B-VII.dev

April 26, 2017

- checkr Warnings:

1. A previous error halted parsing of the current section
MAT=5649, MF= 1, MT=451 (1): Parsing stopped

```
ERROR(S) FOUND IN MAT=5649, MF= 1, MT=451
SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      129 TO      162
```

- checkr Errors:

1. A variable is outside the allowed ENDF range
MAT=5649, MF= 1, MT=451 (0): Variable range

```
ERROR(S) FOUND IN MAT=5649, MF= 1, MT=451
MOD =      1 OUT OF RANGE      0 -      0      RECORD NUMBER      129
```

2. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 2, MT=151 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=5649, MF= 2, MT=151
SECTION 2/151 NOT IN DIRECTORY      RECORD NUMBER      164
```

3. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 1 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 1
SECTION 3/ 1 NOT IN DIRECTORY      RECORD NUMBER      206
```

4. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 2 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 2
SECTION 3/ 2 NOT IN DIRECTORY      RECORD NUMBER      246
```

5. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 4 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 4
SECTION 3/ 4 NOT IN DIRECTORY      RECORD NUMBER      282
```

6. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 16 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 16
SECTION 3/ 16 NOT IN DIRECTORY      RECORD NUMBER      312
```

7. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 17 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 17
SECTION 3/ 17 NOT IN DIRECTORY RECORD NUMBER 331

8. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 22 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 22
SECTION 3/ 22 NOT IN DIRECTORY RECORD NUMBER 341

9. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 28 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 28
SECTION 3/ 28 NOT IN DIRECTORY RECORD NUMBER 357

10. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 51 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 51
SECTION 3/ 51 NOT IN DIRECTORY RECORD NUMBER 372

11. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 52 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 52
SECTION 3/ 52 NOT IN DIRECTORY RECORD NUMBER 402

12. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 53 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 53
SECTION 3/ 53 NOT IN DIRECTORY RECORD NUMBER 431

13. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT= 91 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 3, MT= 91
SECTION 3/ 91 NOT IN DIRECTORY RECORD NUMBER 459

14. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT=102 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 3, MT=102
SECTION 3/102 NOT IN DIRECTORY RECORD NUMBER 487

15. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT=103 (0): Directory (b)

- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=5649, MF= 3, MT=103 | | |
| SECTION 3/103 NOT IN DIRECTORY | RECORD NUMBER | 527 |
16. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT=104 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=5649, MF= 3, MT=104 | | |
| SECTION 3/104 NOT IN DIRECTORY | RECORD NUMBER | 548 |
17. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT=105 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=5649, MF= 3, MT=105 | | |
| SECTION 3/105 NOT IN DIRECTORY | RECORD NUMBER | 566 |
18. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT=106 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=5649, MF= 3, MT=106 | | |
| SECTION 3/106 NOT IN DIRECTORY | RECORD NUMBER | 580 |
19. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 3, MT=107 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=5649, MF= 3, MT=107 | | |
| SECTION 3/107 NOT IN DIRECTORY | RECORD NUMBER | 586 |
20. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 4, MT= 2 (0): Directory (b)
- | | | |
|--|---------------|-----|
| ERROR(S) FOUND IN MAT=5649, MF= 4, MT= 2 | | |
| SECTION 4/ 2 NOT IN DIRECTORY | RECORD NUMBER | 613 |
21. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 4, MT= 16 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=5649, MF= 4, MT= 16 | | |
| SECTION 4/ 16 NOT IN DIRECTORY | RECORD NUMBER | 1038 |
22. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 4, MT= 17 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=5649, MF= 4, MT= 17 | | |
| SECTION 4/ 17 NOT IN DIRECTORY | RECORD NUMBER | 1069 |
23. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 4, MT= 22 (0): Directory (b)

- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=5649, MF= 4, MT= 22 | |
| | SECTION 4/ 22 NOT IN DIRECTORY | RECORD NUMBER 1086 |
24. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 4, MT= 28 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=5649, MF= 4, MT= 28 | |
| | SECTION 4/ 28 NOT IN DIRECTORY | RECORD NUMBER 1113 |
25. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 4, MT= 51 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=5649, MF= 4, MT= 51 | |
| | SECTION 4/ 51 NOT IN DIRECTORY | RECORD NUMBER 1138 |
26. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 4, MT= 52 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=5649, MF= 4, MT= 52 | |
| | SECTION 4/ 52 NOT IN DIRECTORY | RECORD NUMBER 1275 |
27. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 4, MT= 53 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=5649, MF= 4, MT= 53 | |
| | SECTION 4/ 53 NOT IN DIRECTORY | RECORD NUMBER 1390 |
28. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 4, MT= 91 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=5649, MF= 4, MT= 91 | |
| | SECTION 4/ 91 NOT IN DIRECTORY | RECORD NUMBER 1445 |
29. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 5, MT= 16 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=5649, MF= 5, MT= 16 | |
| | SECTION 5/ 16 NOT IN DIRECTORY | RECORD NUMBER 1503 |
30. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 5, MT= 17 (0): Directory (b)
- | | | |
|--|---|--------------------|
| | ERROR(S) FOUND IN MAT=5649, MF= 5, MT= 17 | |
| | SECTION 5/ 17 NOT IN DIRECTORY | RECORD NUMBER 1633 |
31. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 5, MT= 22 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 5, MT= 22
SECTION 5/ 22 NOT IN DIRECTORY RECORD NUMBER 1693

32. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 5, MT= 28 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 5, MT= 28
SECTION 5/ 28 NOT IN DIRECTORY RECORD NUMBER 1796

33. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=5649, MF= 5, MT= 91 (0): Directory (b)

ERROR(S) FOUND IN MAT=5649, MF= 5, MT= 91
SECTION 5/ 91 NOT IN DIRECTORY RECORD NUMBER 1889

- **psyche** Warnings:

1. Strength function in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 138. L = 1 / STRENGTH FUNCTION IS 1.07564E-04 / AVERAGE GAMMA WIDTH 3.31250E-02 / LIES OUTSIDE LIMITS 4.00000E-02 TO 9.00000E+00 EV. (0): URR str. ftn.

```
FILE 2
SECTION 151
ISOTOPE MASS = 138. L = 1
STRENGTH FUNCTION IS 1.07564E-04
AVERAGE GAMMA WIDTH 3.31250E-02
... [1 more lines]
```

- **groupie** Errors:

1. Very small elastic cross section found
0: Small elastic

Multi-Group and Multi-Band Parameters from ENDF/B Data (GROUPIE 2015-2)

```
-----
ENDF/B Input and Output Data Filenames
ENDFB.IN
ENDFB.OUT
... [97 more lines]
```

- **fudge-4.0** Warnings:

1. Missing a channel with a particular angular momenta combination
resonances / resolved / MultiLevelBreitWigner (Error # 0): missingResonanceChannel

```
WARNING: Missing a channel with angular momenta combination L = 0, J = 1.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 0.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 1.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 2.5 and S = 1.5 for "capture"
```

2. Potential scattering hasn't converted, you need more L's!
resonances / resolved (Error # 1): potentialScatteringNotConverged

WARNING: Potential scattering hasn't converged by L=1 at E=140000.0 eV, xs[1]/xs[0]=0.899008981347% > 0.1%

• fudge-4.0 Errors:

1. Calculated and tabulated Q values disagree.
reaction label 5: n[multiplicity:'2'] + Ba137 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -9151947.424667358 eV vs -8.6114e6 eV!

2. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Ba137 / Product: n / Distribution: / uncorrelated - angular - XYs2d: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (8674403.0 -> 20000000.0) vs (8674400.0 -> 20000000.0)

3. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Ba137 / Product: n / uncorrelated - energy - XYs2d: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (8674403.0 -> 20000000.0) vs (8674400.0 -> 20000000.0)

4. Calculated and tabulated Q values disagree.
reaction label 6: n[multiplicity:'3'] + Ba136 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -16057556.87547302 eV vs -1.5511e7 eV!

5. Calculated and tabulated Q values disagree.
reaction label 7: n + H1 + Cs137 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -9545229.176177979 eV vs -9.0046e6 eV!

6. Energy range of data set does not match cross section range
reaction label 7: n + H1 + Cs137 / Product: n / Distribution: / uncorrelated - angular - XYs2d: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (9070503.0 -> 20000000.0) vs (9070500.0 -> 20000000.0)

7. Energy range of data set does not match cross section range
reaction label 7: n + H1 + Cs137 / Product: n / uncorrelated - energy - XYs2d: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (9070503.0 -> 20000000.0) vs (9070500.0 -> 20000000.0)

8. Calculated and tabulated Q values disagree.
reaction label 8: Ba139 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 4183204.430877686 eV vs 4.7234e6 eV!

9. Calculated and tabulated Q values disagree.
reaction label 9: n + He4 + Xe134 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -3102283.335922241 eV vs -2.572e6 eV!

10. Calculated and tabulated Q values disagree.
reaction label 10: H1 + Cs138_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -5132104.044342041 eV vs -4.5932e6 eV!

11. Calculated and tabulated Q values disagree.
reaction label 11: H2 + Cs137_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -7320663.075241089 eV vs -6.7801e6 eV!

12. Calculated and tabulated Q values disagree.
reaction label 12: H3 + Cs136_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -9341635.186401367 eV vs -8.7963e6 eV!

13. Calculated and tabulated Q values disagree.
reaction label 13: He3 + Xe136_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -9236618.053833008 eV vs -8.7023e6 eV!

14. Calculated and tabulated Q values disagree.
reaction label 14: He4 + Xe135_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 3261576.629104614 eV vs 3.8802e6 eV!

• njoy2012 Warnings:

1. Evaluation has no unresolved resonance parameters given
unresr...calculation of unresolved resonance cross sections (0): No URR

---message from unresr---mat 5649 has no unresolved parameters
copy as is to nout

2. Evaluation has no unresolved resonance parameters given
purrr...probabalistic unresolved calculation (0): No URR

---message from purrr---mat 5649 has no unresolved parameters
copy as is to nout

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
grouprr...compute self-shielded group-averaged cross-sections (0): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 16
only mf4/mf5 provided

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
grouprr...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 17
only mf4/mf5 provided

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 22
only mf4/mf5 provided

6. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 28
only mf4/mf5 provided

7. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (4): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 91
only mf4/mf5 provided